

# Joshua Tree



Joshua tree and *Yucca* landscape,  
Esmeralda County.

Photo by Elisabeth Ammon.

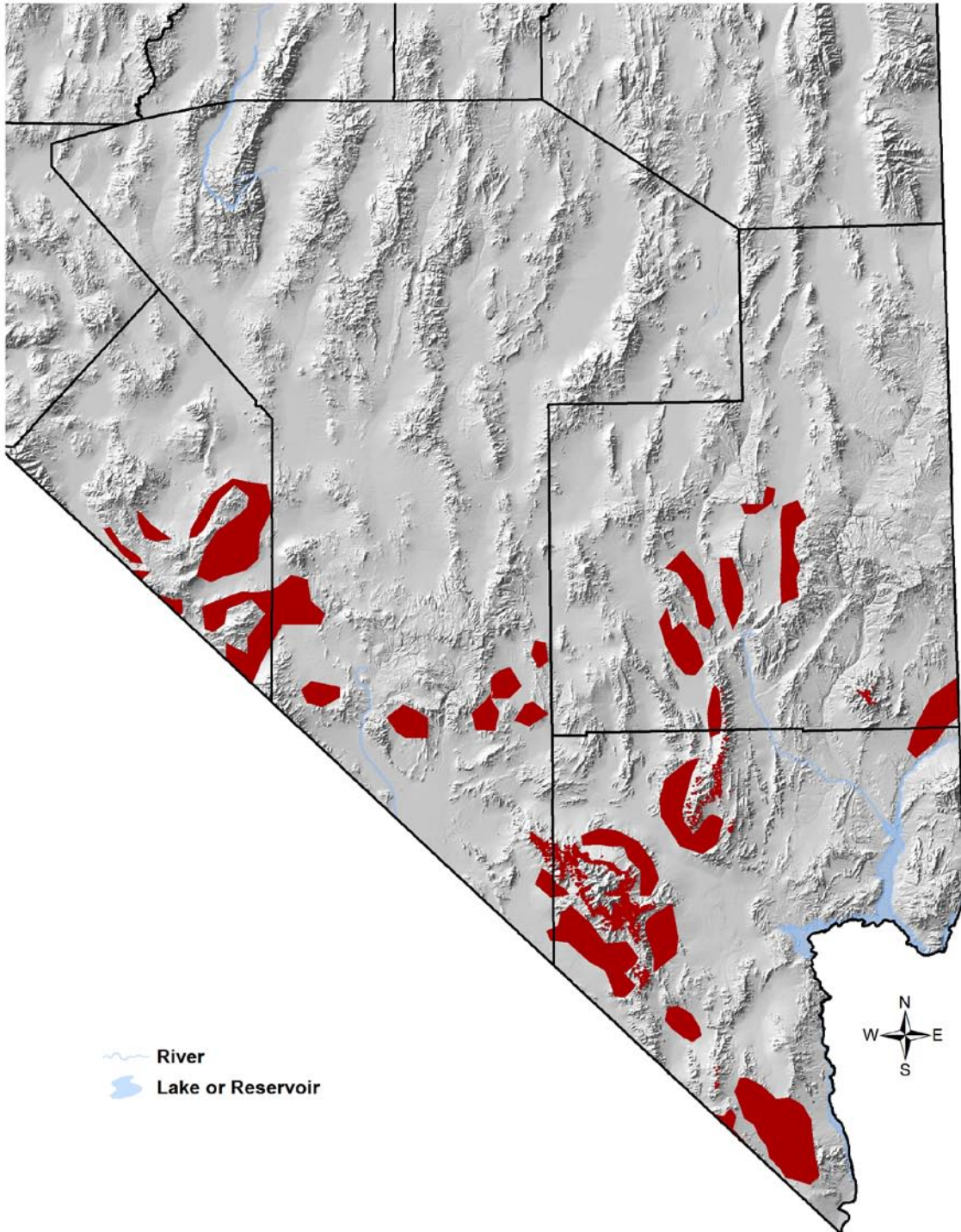
## Key Bird-Habitat Attributes

Stand Structure	Multiple species of shrubs in a park-like setting; Joshua trees and other <i>Yuccas</i> ; older larger Joshua trees and <i>Yuccas</i> useful to some Priority species; healthy shrub understory and litter layer for foraging opportunities
Ideal Scale for Conservation Action	> 200 ha [500 ac]
Understory and Invasive Species	Species-rich shrub understory, ideally with flowering forbs and shrubs; invasive plants detrimental
Fire Regime; Invasive Plants	Fire prevention important; invasive plants increase risk of fire and should be managed aggressively in this habitat type
Distance to Riparian/Spring Habitats	Proximity of water features increases habitat value to birds
Presence of Cliffs > 30 m [100 ft] Tall	Presence of tall cliffs increases value to birds

## Conservation Profile

Estimated Cover in Nevada	626,000 ha [1,547,000 ac] 2.2% of state
Landownership Breakdown	BLM = 72% FWS = 10% DOD = 7% DOE = 5% Other = 6%
Priority Bird Species	Costa's Hummingbird Gilded Flicker Bendire's Thrasher Le Conte's Thrasher Black-chinned Sparrow (Golden Eagle) (Prairie Falcon) (Burrowing Owl)
Indicator Species	Cactus Wren Scott's Oriole
Most Important Conservation Concerns	Climate change (change in precipitation temperature) Increased fire frequency/intensity Invasive plants Urban, suburban, and industrial development Motorized recreation Livestock, wild horse, and burro grazing
Habitat Recovery Time	150-200 years
Regions of Greatest Conservation Interest	Clark, Esmeralda, and southern Nye, Lincoln counties
Important Bird Areas	Lake Mead Pahranagat Valley Complex Spring Mountains Desert NWR Wee Thump Joshua Tree Forest

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Habitat classified by from broad-scale Joshua Tree maps provided by USGS (Todd Esque, pers. comm.). Some areas may be misclassified.

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## Overview

In this plan, Joshua Tree (*Yucca brevifolia*) habitat includes all Mojave mid-elevation mixed scrub that supports Joshua trees, other *Yucca* species, and cactuses. The overriding conservation challenge associated with this habitat type is its long recovery time (150-200 years), meaning that once habitat is destroyed, it is unlikely to be recovered within time frames relevant to ongoing conservation planning. Any loss of Joshua Tree habitat should therefore be considered functionally irreversible, and should be avoided whenever possible. Of particular concern are invasive plants that increase vulnerability to fire (particularly red brome, *Bromus rubens*), and ignition of fires by humans (Brooks and Matchett 2006). Particular areas of interest for protection include the McCullough and Newberry Mountains in southern Clark County, because they contain the full suite of Priority species for this habitat type (Beason and Jentsch 2001). Other Joshua tree areas have not yet been as well-inventoried as these two mountain ranges, but likely contain areas of bird conservation interest, as well.

A few Nevada species are very strongly associated with Joshua Tree habitat, including two Priority species, Bendire's Thrasher and the very rare Gilded Flicker. For both of these species, Joshua trees, *Yuccas*, and cactuses need to have reached a mature or old-growth stage before they are suitable for nesting. Black-chinned Sparrows occur at the upper elevation range of Joshua Tree habitat where it interfaces with the pinyon-juniper zone and provides a diverse shrub understory. Costa's Hummingbird and Le Conte's Thrasher are additional Priority species that use this habitat type, especially if it occurs in close proximity to ephemeral washes, springs, or riparian areas. The two Indicator species Cactus Wren and Scott's Oriole were selected because they are relatively common birds than can reliably be found in intact, healthy Joshua Tree habitat even when the Priority species are absent. Figure Hab-9-1 illustrates an idealized and compressed version of the Joshua tree landscapes that favor Priority bird species.

## Main Concerns and Challenges

The following top seven conservation concerns were identified in our planning sessions for Joshua Tree habitat in Nevada:

- Change in precipitation and snowmelt related to climate change
- Change in temperature related to climate change
- Increased fire frequency or intensity
- Invasive weeds
- Urban, suburban, and industrial development
- Motorized recreation
- Livestock/wild horse and burro grazing

Traditional concerns for Joshua Tree habitat include loss to development and impacts from motorized recreation, domestic livestock, wild horses, and burros. However, habitat-destroying

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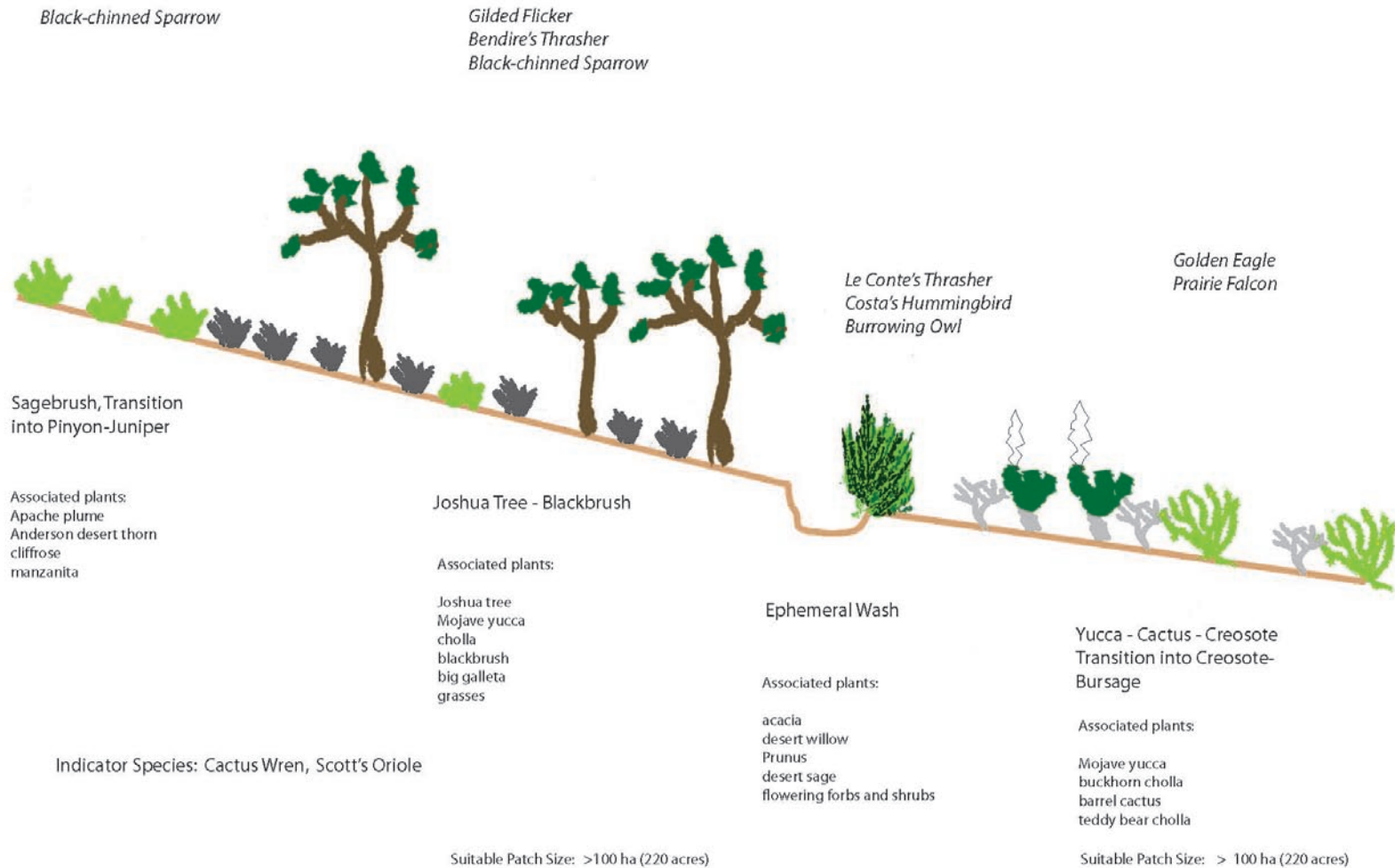
fire and changes in precipitation and temperature are far more threatening for this habitat type over the longer term. Even though Joshua trees and *Yuccas* are drought-adapted, they require relatively wet conditions for establishment of young plants, which grow very slowly even in ideal conditions (Vamstad and Rotenberry 2010). Survival of young plants, even after establishment, may be greatly compromised by prolonged droughts (DeFalco et al. 2010). Invasion by annual weeds is a compounding threat for this habitat type, mostly because it increases the risk of large fires, which usually eliminate young Joshua trees and reduce survival of older trees (DeFalco et al. 2010). Furthermore, fires are likely to occur more frequently in weed-infested areas, which may keep native plants from ever reaching the late-successional stages (Vamstad and Rotenberry 2010) required by Bendire's Thrasher and Gilded Flicker. Several large fires destroyed significant amounts of Joshua Tree habitat in the mid-2000's, and efforts should be made to prevent further losses wherever possible.



Nevada Bird Count transect in Joshua Tree habitat. Photo by Jen Ballard.

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Not To Scale



**Figure Hab-8-1:** Idealized Joshua tree landscape to maximize the number of Joshua tree associated Priority bird species.

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## Conservation Strategies

### Habitat Strategies

- **Manage at landscape scale (> 200 ha [500 ac]).** High species richness in shrubs, old-growth *Yucca* spp., and cholla cactuses are particularly suitable for birds
- **Aggressive fire prevention and weed control** in Joshua Tree habitat are currently the most important stop-gap measures for habitat loss. Fire management and invasive weed control may be coordinated across agencies to be most effective
- Proximity to **ephemeral washes or springs**, presence of **cliffs** > 30 m [100 ft] tall, or **abandoned mines** (which may be gated) raise the priority level of a site for bird conservation. However, due to the long habitat recovery time, we recommend avoiding **all** future losses of Joshua Tree habitat to the maximum extent possible
- Where removal of Joshua trees, Yuccas, and cactuses cannot be avoided, we strongly recommend that they be **replanted in suitable sites**, such as recently-burned Joshua tree areas
- The majority of Priority bird species nest between **April 1 and July 1**, and some of them are sensitive to nest disturbance, which should be minimized when possible

### Research, Planning, and Monitoring Strategies

- Joshua tree stands in Nevada are not fully mapped yet. We recommend that Clark County's Desert Conservation Program's current effort to map these habitats in Clark County be expanded into Nye and Esmeralda counties through a multi-agency inventory effort, and further that other Joshua Tree mapping efforts underway by USGS be used to generate the best possible GIS maps of Joshua tree occurrence, density, and condition
- **Monitoring stand conditions and habitat loss** will be critical for effective adaptive management efforts in light of climate change and increased fire frequency. Therefore, we recommend that a comprehensive monitoring plan for Joshua Tree habitats, perhaps similar to forestry monitoring practices, be developed and implemented
- Continue **long-term monitoring of landbirds** statewide through the Nevada Bird Count
- **Research the effects of new threats**, such as new invasive weeds, motorized recreation, and climate change to determine the most effective management strategies

### Public Outreach Strategies

- **Promote public appreciation** of healthy Joshua Tree – *Yucca* landscapes and bird communities, particularly with regard to native understory vegetation and threats from off-road vehicle recreation